

THE PSILOPSOCIDAE (PSOCOPTERA) OF NEW GUINEA

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Synopsis

Two new species of *Psilopsocus* from New Guinea are described, additional information on *Ps. nigricornis* Enderlein, the type species, is given, and a key to the known species is provided.

Enderlein (1903) erected the genus *Psilopsocus* for *Ps. nigricornis* from New Guinea. Mockford (1961) described *Ps. nebulosus* from the Philippines, and Smithers (1963) described *Ps. mimulus* from Australia, at the same time recording the family from South Africa on the basis of nymphal material only of an undescribed species.

This paper is a contribution to the study of the Psocoptera of the Melanesian Arc; in it are described two further species of *Psilopsocus* from New Guinea, additional information is given on *Ps. nigricornis*, and a key to the five known species is included.

Psilopsocus pulchripennis sp.n.

Male

Coloration (in alcohol). Head dull ivory with brown markings. Median epicranial suture very dark brown. Vertex with a narrow brown band adjacent to the inner margins of the compound eyes and on either side of the epicranial suture, which broadens posteriorly to cover the back of the head. This gives the impression that the top of the head is brown with two narrow anteriorly converging ivory bands running parallel with inner margins of the compound eyes and a little mesad of them. Frons ivory with a dark brown spot between the anterior ocellus and the epistomial suture. Postclypeus ivory with nine dark brown stripes which do not converge anteriorly but run *parallel to one another* throughout their length from the epistomial suture to the anterior margin of the postclypeus. Anteclypeus very dark brown in the middle of the posterior half, elsewhere colourless. Labrum dark brown with a median colourless area near the anterior margin. Genae pale with a dark brown spot above mandibular attachment. Scape and pedicel very pale brown; flagellar segments black. Eyes black. Ocellar tubercle black. Maxillary palp with basal and second segments pale brown; third and distal segments black. Dorsum of mesothorax brown, paler adjacent to sutures. Fore and middle legs with femora and tibiae pale brown, the latter with a very dark brown apical band; tarsi very dark brown. Femur of hind leg almost colourless with dark brown band at the distal quarter; remainder of hind leg pale except for the dark brown middle and distal tarsal segments. Fore wing (Fig. 5) with reddish brown pterostigma. Membrane marked in shades of grey-brown. Veins yellowish brown to dark brown except for cu_2 and the basal half of cu_{1a} , which are colourless. Hind wing hyaline, tinged with grey brown in the distal half, more densely so near apex, and near hind margin. Veins dark brown except for colourless cu_2 . Abdomen pale, irregularly banded in shades of reddish brown; apical structures very dark brown.

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Morphology. Length of body: 3.3 mm. Median epicranial suture very well defined, anterior arms less so. Vertex smoothly rounded with a very fine, short, sparse pubescence. Frons, postclypeus, labrum and genae similarly pubescent. Lengths of flagellar segments: f_1 : 1.0 mm; f_2 : 1.0 mm. Scape and pedicel much thicker than the long slender flagellar segments which bear long, fine setae. Eyes large, inner margins above diverging strongly behind; reaching a little above vertex and a little behind the head. IO/D: 0.55; PO: 0.88. Ocelli fairly large. Measurements of hind leg: F: 0.75 mm. T: 1.5 mm; t_1 : 0.45 mm; t_2 : 0.075 mm; t_3 : 0.1 mm; rt: 6:1:1.3; ct: 18, 1, 1. Fore wing length: 4.5 mm; fore wing width: 1.6 mm. Pterostigma of fore wing (Fig. 5) with well marked hind angle with an extremely short spur vein. Veins *rs* and *m* meeting in a point; m_1 meets wing margin at apex; apex of areola postica more than halfway from hind margin to *m*. Vein cu_{1a} arises well basad of point where cu_{1b} reaches margin. Hind wing length: 3.5 mm; hind wing width: 1.2 mm. Hind wing with *rs* and *m* fused for a fairly long length. Vein *m* curves after separation from *rs* to run almost parallel with costal margin. Epiproct (Fig. 6) well sclerotized, with sinuous hind margin; a row of four small setae occurs near hind margin; two similar setae lie basad of the end setae of the row. Paraproct (Fig. 7) with broad, blunt-ended dorsally-directed process and a posterior, narrow, ventrally-directed, blunt rod. Hypandrium simple, sclerotized, rounded behind with the posterior and lateral edges upturned to form a bowl in which lies the phallosome; lightly setose. Phallosome (Fig. 4) in the form of a simple sclerotized ring of varying thickness, open anteriorly with little sclerotization of the penial bulb.

Material Examined

New Guinea: 1 ♂ (holotype), Kassem Pass, 1.ix.1970 (C.N.S. and I.W.B.T.). The holotype will be deposited in the Australian Museum.

Discussion

Ps. pulchripennis differs from other species of the genus in that cells M_1 , M_2 and M_3 of the fore wing are centrally darker than they are nearer the veins and the paraproct is of distinctive shape. The female is unknown.

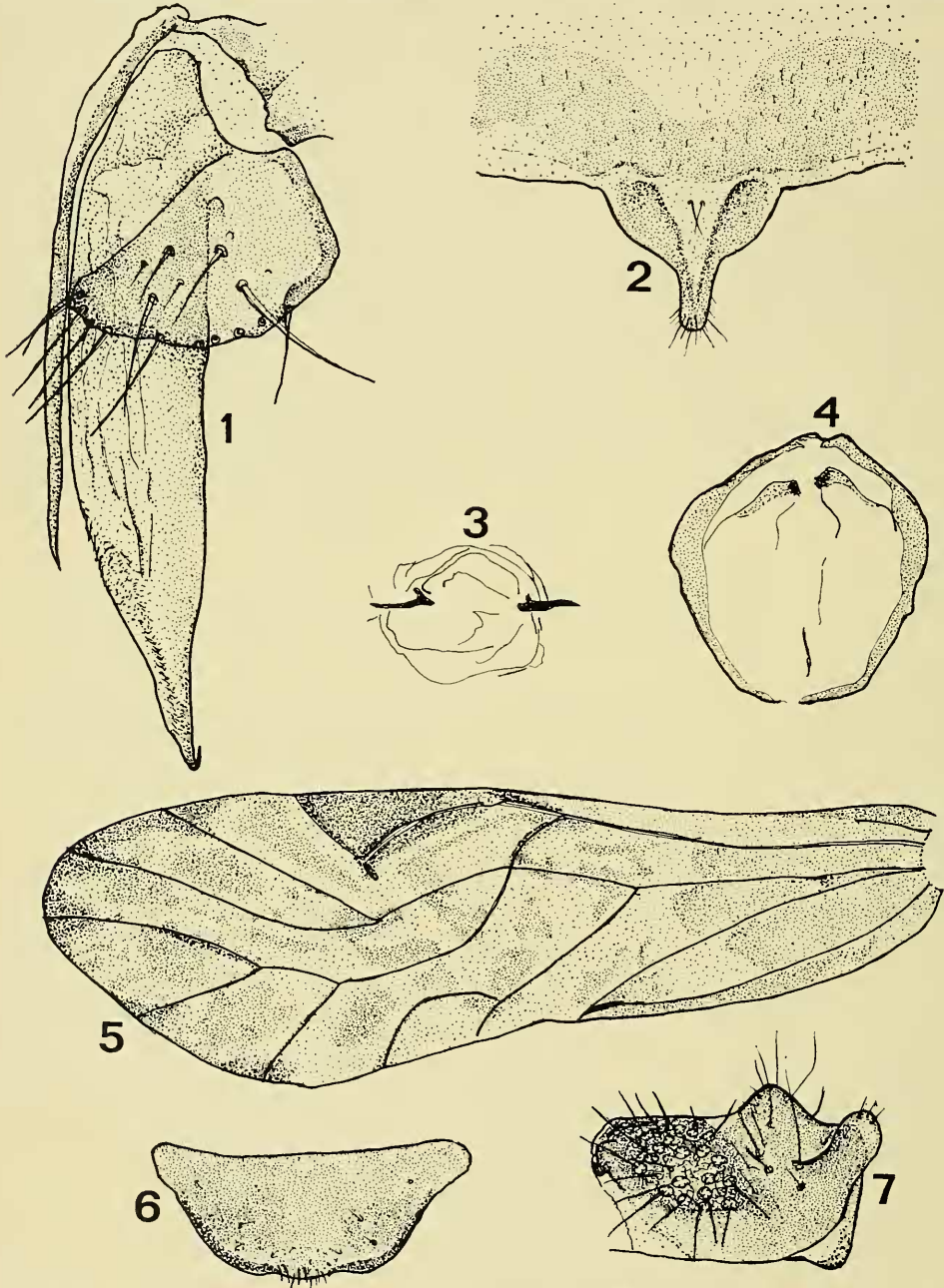
Psilopsocus marmoratus sp.n.

Male

Coloration (in alcohol). Head ivory with brown markings. Median epicranial suture pale. Vertex ivory with a brown band along inner margin of eye and a similar band, broadening posteriorly, on either side of median epicranial suture. Frons ivory with a V-shaped mark anterior to median ocellus, the arms of the V reaching the epistomial suture and passing on either side of a small median dark brown spot. Postclypeus with *parallel* brown stripes. Anteclypeus dark brown posteriorly, colourless anteriorly. Labrum dark brown, colourless in middle near distal margin. Genae ivory with a brown mark immediately below insertions of antennae. Scape and pedicel pale, flagellar segments black. Ocellar tubercle black. Basal and second segment of maxillary palp pale, remaining segments very dark brown. Dorsum of mesothorax brown, pale adjacent to sutures. Femora brown; tibiae pale brown, middle and distal tarsal segments a little darker. Fore wings (Fig. 8) patterned in shades of grey-brown; pterostigma reddish brown. Veins brown except for $m+cu$, cu_2 and basal half of cu_{1a} . Hind wings hyaline, faintly tinged with grey near anterior margin. Veins brown except for pale cu_2 . Abdomen pale, marked irregularly in reddish brown. Terminal structures dark brown.

Morphology. Length of body: 2.6 mm. Median epicranial suture distinct; anterior arms less so. Head with short, fine, sparse pubescence. Lengths of

flagellar segments: f_1 : 0.7 mm; f_2 : 0.7 mm. Scape and pedicel short and stout; flagellar segments long and slender; bearing long fine setae. Eyes fairly large but not reaching level of vertex when viewed from the side nor extending behind head when seen from above; inner margins strongly diverging



Figs 1-3. *Psilopsocus nigricornis* End. 1, ♀ gonapophyses. 2, ♀ subgenital plate. 3, ♀ sclerotizations of 9th sternite. Figs 4-6. *Ps. pulchripennis* sp. n. 4, ♂ phallosome. 5, ♂ fore wing. 6, ♂ epiproct. 7, ♂ paraproct.

behind. IO/D : 1.1 ; PO : 0.9. Ocelli large. Measurements of hind leg : F : 0.55 mm ; T : 1.05 mm ; t_1 : 0.35 mm ; t_2 : 0.05 mm ; t_3 : 0.075 mm ; rt : 7 : 1 : 1.5 ; ct : 16, 1, 1. Fore wing length : 3.2 mm ; fore wing width : 1.2 mm. Pterostigma with sharp hind angle and spur vein extending almost halfway from pterostigma to *rs*. Apex of pterostigma more than halfway from wing margin to *m*. Vein m_1 meets wing margin at wing apex. Hind wing length : 2.4 mm ; hind wing width : 0.8 mm. Hind wing with *rs* and *m* fused for a fairly long length. Epiproct (Fig. 12). Paraproct (Fig. 10) with a broad, blunt-ended dorsally-directed process. Phallosome very similar to that of *Psilopsocus pulchripennis* (Fig. 4).

Female

Coloration (in alcohol). As in male but a little darker with hyaline areas of wing near margin a little more extensive.

Morphology. Length of body : 2.8 mm. Lengths of flagellar segments : f_1 : 0.8 mm ; f_2 : 0.8 mm. Eyes smaller than in male also not reaching level of vertex. IO/D : 1.0 ; PO : 0.75. Ocelli large. Measurements of hind leg : F : 0.57 mm ; T : 1.1 mm ; t_1 : 0.32 mm ; t_2 : 0.05 mm ; t_3 : 0.075 mm ; rt : 6.4 : 1 : 1.5 ; ct : 13, 1, 1. Fore wing length 3.5 mm ; fore wing width : 1.2 mm. Venation as in male. Hind wing length : 2.7 mm ; hind wing width : 0.9 mm. Epiproct simple, sclerotized, with a few strong setae in distal half and a few small setae in basal half. Middle section of hind margin a little more strongly sclerotized than elsewhere. Subgenital plate (Fig. 11). Gonapophyses (Fig. 9) with slender ventral valve ; dorsal valve broad-based narrowing suddenly to slender, pointed, distal half ; external valve ovoid. Sclerotizations around entrance to spermatheca shown in Fig. 13.

Material Examined

New Guinea : 1 ♂ (holotype), McAdam Park, near Wau, 5.ix.1970. (C.N.S. and I.W.B.T.) ; 1 ♀ (allotype), Mt. Missim, near Wau, 1,500 m, 7.ix.1970. (C.N.S. and I.W.B.T.) ; 1 ♂ (paratype), Gauka, S of Minj, 1,660 m, 22.viii.1970. (C.N.S. and I.W.B.T.). Holotype, allotype and paratype in Australian Museum.

The paratype male is much paler than the other specimens and was probably collected soon after moulting.

Discussion

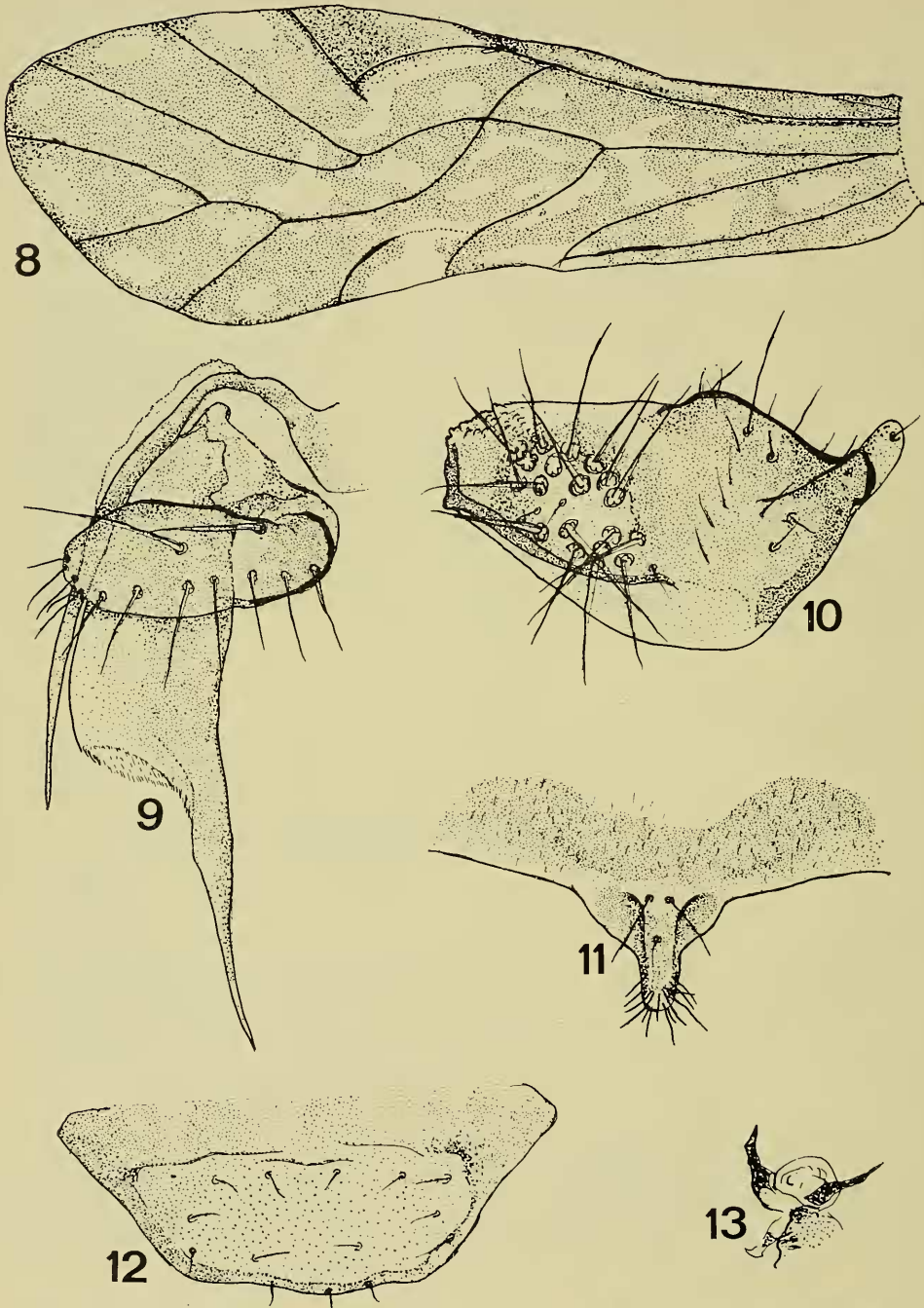
Ps. marmoratus differs from other species of the genus, except *Ps. nigricornis*, in having the distal cells of the fore wing with a well-defined hyaline area at or near the wing margin. The female differs from that of *Ps. nigricornis* in the form of the dorsal valve of the gonapophyses (*cf.* Figs 1 and 9). The dorsal valve in *Ps. nigricornis* is characteristically recurved (Fig. 1).

Psilopsocus nigricornis Enderlein

The female now available permits expansion of the original description by illustration of the subgenital plate (Fig. 2), the gonapophyses (Fig. 1) and the sclerotizations round the entrance to the spermatheca (Fig. 3). The male remains unknown. Enderlein (1903, pl. xiv, fig. 74) gives an illustration of the wings.

Material Examined

New Guinea : 1 ♀, Bainyik, 12.xii.1963. (D. K. McAlpine.)



Figs 8-13. *Psilopsocus marmoratus* sp. n. 8, ♂ fore wing. 9, ♀ gonapophyses. 10, ♂ paraproct. 11, ♀ subgenital plate. 12, ♂ epiproct. 13, ♀ sclerotizations of 9th sternite.

KEY TO THE SPECIES OF *Psilopsocus*

1. Fore wing with clearly defined, hyaline areas at or near wing margin in cells M_1 and M_2 2
Fore wing without such clearly defined hyaline areas 3
2. Cell M_2 with a hyaline spot proximally and another near the wing margin . . . *marmoratus* sp. n.
Cell M_2 with hyaline spot near wing margin only *nigricornis* Enderlein
3. Colour in distal half of cell R_5 and in cells M_1 and M_2 uniform, not mottled . . *nebulosus* Mockford
Colour pattern in distal half of cell R_5 and cells M_1 and M_2 mottled 4
4. Vein cu_{1b} half as long as cu_{1a} *mimulus* Smithers
Vein cu_{1b} much less than half as long as cu_{1a} *pulchripennis* sp. n.

In addition to the wing characters used in the above key, perusal of the descriptions in this and the papers referred to will reveal many differences of detail between species in wing pattern, phallosomes, subgenital plates and gonapophyses. In particular, the form of the dorsal valves of the gonapophyses and the proportions of the subgenital plates are useful characters in females. In males, there are differences in the degree and form of the sclerotizations of the penial bulb, slight though these are in this genus. *Ps. pulchripennis* and *Ps. marmoratus* have, however, very similar phallosomes. *Ps. mimulus* has a very distinctive areola postica owing to the branching of cu_1 being much nearer the wing base than in any other species.

ACKNOWLEDGEMENT

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References

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